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AMMOCRYPTOCHARAX ELEGANS, A NEW GENUS
AND SPECIES OF RIFFLE-INHABITING
CHARACOID FISH (TELEOSTEI: CHARACIDAE)
FROM SOUTH AMERICA

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The new genus and species, *Ammocryptocharax elegans*, described here first came to our attention in 1970 in a small collection of fishes received from the Brazilian-Bolivian border region. Since that time we have acquired additional collections from Brazil, Colombia, and Venezuela. The elongate body and head, and the ventral mouth superficially resemble these features in the sand darters of the North American genus *Ammocrypta* Jordan. This again attests to the remarkably divergent evolutionary radiation of South American characoids (see Weitzman, 1962). *Ammocryptocharax elegans* has been described in life as being bright "grass green" and occurring among water plants in small riffles where it was taken in the Caño Muco, Colombia (J. Thomerson, pers. comm.). It is not known if the fish burrows in sand or dives in among rocks and stones although its slender body shape, ventral mouth, and conic snout would suggest such ability.

The new genus described here belongs to the Characidiinae, a group of primarily South American characoid fishes (one species, *Characidium marshi* Breder, is known from the Tuira basin in Panama) of uncertain family affinities and here tentatively assigned to the Characidae. Géry (1971) recognized the Characidiinae to be of family rank

and proposed and described three subfamilies in his Characidiidae, the Characidiinae, Elacocharacinae, and Geisleriinae. In our opinion, his subfamilies Elacocharacinae and Geisleriinae represent specialized lineages within the Characidiinae, and are in part characterized by reductive trends present to a minor degree in the Characidiinae of Géry. We currently are preparing a discussion of the relationships of the genera of the Characidiinae and for the present accept only one taxon at the family-group level, the Characidiinae.

The methods of counting and measuring specimens used below are those described by Fink and Weitzman (1974). Standard length (SL) body measurements are in mm. Other measurements are expressed as percentages of standard length. Specimens have been deposited in the following museums: Academy of Natural Sciences, Philadelphia (ANSP); British Museum (Natural History) (BMNH); California Academy of Sciences, San Francisco (CAS); Field Museum of Natural History, Chicago (FMNH); Florida State Museum, Gainesville (F); Instituto Nacional Pesquisas da Amazonia, Manaus (INPA); Museo de Biología, Universidad Central de Venezuela, Caracas (MBUCV-V); Museu de Zoologia da Universidade de São Paulo (MZUSP); National Museum of Natural History, United States National Museum (USNM); and the Zoological Museum of Amsterdam (ZMA). Specimens borrowed from Dr. J. Géry were from his private collection.

The abbreviation EPA refers to the Expedição Permanente da Amazonia, a program for collecting Amazonian biota under the direction of Dr. Paulo Vanzolini and financially supported by the Fundação de Amparo à Pesquisa do Estado São Paulo.

***Ammocryptocharax*, new genus**

Type-species: Ammocryptocharax elegans, new species.

Diagnosis: This new genus may be distinguished from other genera in the Characidiinae by the following combination of characters. Anterior ventral border of maxillary bones with a single row of up to ten conic or tricuspid teeth; premaxillary with a single row of conic or tricuspid teeth; dentary with an outer row of conic or tricuspid

teeth and an inner row of conic teeth, sometimes inner and outer rows may form three irregular rows of small conic teeth where they converge on posterior dentary ramus; ectopterygoid teeth present, sometimes covering entire surface of bone, mesopterygoid teeth present or absent; fewer than 17 dorsal-fin rays; mouth ventral; posterior part of parietal cranial fontanel present, moderately well-developed; anterior two infraorbital bones flattened plates with well-developed sensory canals; remaining infraorbitals represented by bony laterosensory tubes; lateral line complete; adipose fin present.

Discussion: *Ammocryptocharax* appears most closely related to the monotypic *Klausewitzia* Géry (1965b) and like the latter possesses maxillary teeth. *Ammocryptocharax* noticeably differs from *Klausewitzia* in having the mouth ventral (rather than terminal) and in having an elongate body and head. These characters might seem to be of little importance and a fuller realization of why we consider *Ammocryptocharax* a distinct genus requires a comparative discussion of its morphological characters. In the following discussion we attempt to establish the evolutionary relationships of *Klausewitzia* and *Ammocryptocharax*. The significance of characters are evaluated in the terms of phylogenetic systematics in which shared advanced (synapomorphic) characters at a given taxonomic "level" are considered appropriate for determining relationships. See Weitzman and Fink (in press) for a discussion of the problem of advanced vs. primitive characters in characoids.

Eigenmann (1917) in his key used, among several morphological features, character states of the maxillary teeth for separation and definition of characid genera. Some of his dichotomies were based on such character states as the (1) absence of maxillary teeth, (2) possession of a few teeth along the anterior ventral border of the posterior maxillary ramus, or (3) presence of many teeth along the entire or nearly entire ventral border of the posterior ramus. Except for the presence or absence of teeth, the difference between character states two and three is sometimes very subjective. In evaluating the presence or absence of maxillary teeth as a character in the Characidiinae, it should be noted that most characoids have maxillary teeth and their presence is probably plesiomorphic (primitive) for characoids as a whole and for the Characidiinae as well.

Maxillary teeth were unknown in the subfamily Characidiinae until Géry (1965b) described them in a new species, *Klausewitzia ritae*, and based his new genus *Klausewitzia* primarily on its possession of maxillary teeth. Of the nearly 30 species of Characidiinae we have examined, only the new species described below, *Ammocryptocharax elegans* (Figs. 1-4) as well as *Ammocryptocharax vintoni* (Eigenmann) (1912:pl. 38, figs. 1, 2, and 5) (see also Fig. 5) have maxillary

teeth.¹ We have not seen *K. ritae* but have no doubt about the presence of these teeth in this species. As discussed below, we propose that *A. vintoni* and *A. elegans* are closely related. Comparison of *A. elegans*, Figures 1 and 2, on the one hand with *K. ritae* in Géry (1965b:pl. 18, fig. 17) on the other, shows very different kinds of *Characidium*-like fishes. *A. elegans* and *A. vintoni* are elongate, slender, and rather circular in cross section with long snouts, ventral mouths, and similar color patterns. *K. ritae* has a much shorter, relatively slab-sided body with a nearly terminal mouth and comparatively short snout. In these characters *K. ritae* is more like *Characidium* Reinhardt.

Géry (1971) was uncertain about the presence or absence of maxillary teeth in another of his new species, *Geisleria junki*. We seriously doubt that his single specimen (unavailable to us) has such teeth because in almost all cases where we have been in doubt about the presence of such teeth, alizarin staining has shown them to be absent. Furthermore we did not find maxillary teeth in two specimens of an apparently closely related undescribed species of *Geisleria* (USNM 215288). We do not consider any of the above three species with maxillary teeth to be closely related to *Geisleria*. *Geisleria junki* as discussed by Géry (1971) appears to be close in two characters at least (high total dorsal fin-ray count of 16 rays and low number of pored lateral-line scales, eight), to *Elacocharax pulcher* Myers and *Elacocharax georgiae* Géry. The bodies of *G. junki* and the undescribed species of *Geisleria* noted above are, like those of *Elacocharax* species, relatively short, slab sided, with a terminal mouth and short snout. They are not at all like the long, cylindrical body and long head and snout displayed by the two species of *Ammocryptocharax*. Thus in the Characidiinae there appear to be only two genera posi-

¹*Characidium vintoni* Eigenmann (1909) was synonymized by Schultz (1944:277) with *Characidium laterale* Eigenmann (1909). Schultz stated that *C. laterale*, the name having priority, was the young of *C. vintoni*, both having similar fin-ray counts and color pattern. We agree with Schultz's determination after examining the types of both nominal forms. We find both to be alike in all observable characters, including possession of maxillary teeth.

As mentioned by Trewavas (1960:361), *Characidium laterale* Eigenmann (1909) is a junior homonym of *Characidium lateralis* Boulenger (1895). According to Article 53 of the International Code of Zoological Nomenclature, any name that is a junior homonym of an available name is to be rejected. Thus *Characidium laterale* Eigenmann must be rejected. According to Article 60 of the International Code of Zoological Nomenclature, if the rejected homonym has one or more available synonyms, the oldest of them must be adopted. Therefore the available name for the species in question is *Characidium vintoni* Eigenmann (1909).

tively bearing maxillary teeth, one with two species and the other with one species. If some species of *Geisleria* prove to bear maxillary teeth, this will require a reconsideration of the relationships of *Klausewitzia*, *Ammocryptocharax*, *Elacocharax*, and *Geisleria*.

Since we consider loss of maxillary teeth a reductive apomorphic state in the Characidiinae and since we agree with Hennig (1966) that primitive characters or character states for a given group cannot be used to relate members within that group, we find the presence of maxillary teeth to be of no value in relating the species *K. ritae*, *A. vintoni*, and *A. elegans*. On the other hand, the presence of these teeth in *Klausewitzia* and *Ammocryptocharax* indicates that they are primitive at least in this character in regard to the other known genera of the Characidiinae and therefore may be considered closer in this respect to the common ancestor of the subfamily than the other genera.

In certain other respects, *Ammocryptocharax* and *Klausewitzia* appear to be primitive members of the Characidiinae. For example, as in *Characidium*, both have a complete or nearly complete lateral line and both have ectopterygoid teeth. *A. vintoni* bears mesopterygoid teeth, which among the characoids are otherwise known only in *Hoplerythrinus unitaeniatus* (Spix) (in Spix and Agassiz, 1829), an erythrinid, and *Brittanichthys axelrodi* Géry (1965a), a characid. Retention of mesopterygoid teeth should be considered primitive for characoids but the problem is complicated by their presence in *Brittanichthys axelrodi*.² Both *Ammocryptocharax* and *Klausewitzia* have a relatively low number of dorsal-fin rays (11). These tend to be

² *Hoplerythrinus unitaeniatus* is a member of a possibly primitive characoid family, Erythrinidae see Weitzman (1964) and Roberts (1969). The possession of mesopterygoid teeth is quite understandable in *Hoplerythrinus* if, as would be expected, the presence of such teeth is a primitive character for characoids as a whole. *Ammocryptocharax vintoni* is a specialized offshoot of a primitive section of the Characidiinae, a specialized subfamily of characoids as yet of uncertain relationship, but here tentatively assigned to the Characidae. *Brittanichthys axelrodi* is a highly specialized small characid fish (about 25 mm in standard length) characterized by highly innovative specializations of the caudal-fin rays and by certain peculiar reductions of the bones and laterosensory system of the head, see Weitzman and Fink (in press). The presence of mesopterygoid teeth in these three widely divergent characoid genera may be explained by the hypothesis that teeth and bony tooth patches remain a genetic potential for nearly any oral surface in characoids. If this is true, the use of such characters in proposing relationships should be subject to great caution. All other reports of palatine teeth in characoids investigated by us have turned out to be ectopterygoid teeth, including those of *Xenogoniates bondi* Myers (1942).

more numerous in some other genera of the subfamily, for example 9-12 in *Characidium*, 10-14 in *Jobertina*, 17-21 in *Elacocharax*, and 19 in *Geisleria*. Both *Ammocryptocharax* and *Klausewitzia* have an adipose fin which is absent, so far as known, only in *Geisleria* among the genera of the Characidiinae.

Thus *Klausewitzia* and *Ammocryptocharax* have a few of what appear to be primitive characters not retained by other genera in the Characidiinae. On the whole, *Klausewitzia* appears the more primitive of the two, lacking the ventral mouth and elongate body and head found in *Ammocryptocharax*. Each of these genera, although sharing several characters primitive for the Characidiinae, appears to be on its own line of evolution. *Klausewitzia* appears primitive except for its reduced number of pectoral-fin rays, their lack of branching and possibly their relatively long length; see Géry (1965b).

An examination of the branchiostegal rays in the Characidiinae has shown that their usefulness in providing information about the relative state of specialization in member genera and species is questionable. The number of branchiostegal rays has at various times been ascribed a considerable importance in the interpretation of fish evolution; see Hubbs (1920) and McAllister (1968). Characoids have a low number, three to five, and the number is often stable and characteristic of different subfamilies and families, see Weitzman (1962 and 1964). We assumed the same would be true in the Characidiinae, or at least expected that different species having three, four, or five rays would display a constant number. Examination indicates otherwise since we found variation in single population samples of some species and the number sometimes varies between left and right sides of a single specimen.

For example, *A. elegans* usually has three branchiostegal rays while *A. vintoni* has four (one alizarin preparation and 12 paratypes). A survey of the literature and an examination of alizarin preparations of 15 species of the genus *Characidium* indicate that most species have four, or sometimes five, branchiostegal rays. *A. elegans*, so far as has been observed, usually has three, but one specimen (of 5 alizarin preparations) of this species from the Guaporé river had four such rays, an extra anterior ray being attached to the hypohyal on each side. This species usually has two attached to the ceratohyal and one attached between the ceratohyal and epihyal. A ray attached to the hypohyal is normally present in species with five rays [for example, paratypes of *Characidium japuhybensis* Travassos (1949) have four or five rays and paratypes of *Characidium chupa chupa* Schultz (1944) always have five]. Species with four rays have three attached to the ceratohyal and one attached between the ceratohyal and epihyal. We found one specimen of *Characidium bolivianum* Pearson (1924) with four rays on one side, five on the other side. The extra ray was attached to the hypohyal. With this kind of variation present within a species and also with the differences noted between what appear

to be closely related species, *A. vintoni* and *A. elegans*, we can place little confidence in the stability of this character in Characidiinae.

In summary, *Klausewitzia* and *Ammocryptocharax*, in certain respects at least, appear to be the most primitive genera in the Characidiinae with *Klausewitzia* probably the more primitive of the two. *Klausewitzia* has a modified pectoral fin, its only obvious specialization other than perhaps its relatively small size. *Ammocryptocharax* may be a specialized "offshoot" from a primitive characidiin, having evolved a relatively slender body which is round in cross section, a ventral mouth, and conical protruding snout. Correlated with these differences in morphology are apparent differences in behavior enabling *Ammocryptocharax* to live in riffles and/or cascades; the latter being the only known habitat of *A. vintoni*.

Etymology: The name *Ammocryptocharax* is a combination of the generic names *Ammocrypta*, a genus of North American darters, family Percidae, and *Charax*, a genus of South American characid fishes. The name is established in reference to the superficial resemblance of the two known species of *Ammocryptocharax* to the members of the genus *Ammocrypta*.

***Ammocryptocharax elegans*, new species**

Figures 1-4, Tables 1-2

Holotype: USNM 210692, male, 32.5 mm SL: Colombia, State of Meta, Vichada river basin, Caño Muco about 15 km west of Puerto Gaitán toward Puerto Carreno, J. E. Thomerson, D. C. Hicks, and J. E. Vaques, 2 April 1974.

Paratypes: USNM 214364, 6 specimens (34.5-39.0 mm, SL): same data as holotype; FMNH 80401, 7 (32.0-40.5): same data as holotype.

[*The following specimens are not types*]: ANSP 128336, 2 (37.0-38.5): Colombia, State of Meta, Caño Emma, Finca El Viento, about 33.5 km northeast of Puerto Lopez, J. E. Böhlke, W. Saul, and W. Smith-Vaniz, 18 March 1973; USNM 210691, 36 (28.0-39.8): Brazil-Bolivian border region between Guajara-Mirim and Mato Grosso, Guaporé river drainage, B. von Graeve, 1970; the following series of specimens have the same data as USNM 210691: ANSP 131725, 6 (31.1-35.4); BMNH 1975-7-3.1-6, 6 (31.6-35.5); CAS 33298, 6 (32.1-34.4); FMNH 80402, 6 (31.1-34.8); ZMA 113.747, 6 (29.2-35.7).

FMNH 80419, 3 (27.5-32.5): Venezuela, State of Bolivar, Orinoco River, 13 km south of Puerto Nuevo on road to Puerto Ayacucho, J. E. Thomerson, D. C. Hicks, and D. Taphorn, 1 January 1975; FMNH 80420, 4 (35.0-51.5): Venezuela, Federal Territory of Amazonas, Orinoco River, small stream about 27.6 km north of Puerto Ayacucho, J. E. Thomerson, D. C. Hicks, and D. Taphorn, 13 January 1975; MBUCV-V 7552, 4 (33.5-49.5): same data as preceding specimens;



FIG. 1. *Ammocryptocharax elegans*, new species, USNM 210692, male, 32.5 mm SL, holotype, Colombia, State of Meta, Vichada River basin, Caño Muco about 15 km west of Puerto Gaitán toward Puerto Carreno, April 2, 1974.

deposited at MBUCV-V, 4 (37.1–44.6): Venezuela, Federal Territory of Amazonas, Orinoco River, below a bridge, Guayabal II, just south of Puerto Ayacucho, Agustin Fernández Yépez, 7 May 1969; F 21322, 10 (30.5–42.5): Colombia, State of Meta, Meta River basin, tributary to Yucao River about 4.7 km west of Puerto Gaitán, H. Boshung and party, 5 January 1973; 1 (deposited at INPA, 41.0): Brazil, Amazonas, Igarapé Tarumazinho, approx. 45 km north of Manaus, Graciella Cannella and party, 7 January 1976; MZUSP 7443, 17 (28.4–34.1): Brazil, Amazonas, rio Sanabani, Município of Silves, Heraldo Britski (EPA), 7 to 8 December 1967; MZUSP 7910, 8 (28.9–37.1): Brazil, Pará, Igarapé of rio Jamari near Terra Santa, Heraldo Britski (EPA), 14 December 1967; MZUSP 7912, 4 (17.4–18.8): same data as MZUSP 7910; the following four collections are from the private collections of J. Géry, 2 (45.0–51.0): Brazil, State of Rondonia (Guaporé), Novo River near Porto Velho, R. Geisler, 10 October 1967; 9 (23.5–42.5): Brazil, State of Pará, Igarapé de Pereua, 182 km from Manaus on road to Itacoatiara, R. Geisler, 6 August 1967; 5 (24.0–30.0): Brazil, State of Guaporé, Madeira River at Guajara-Mirim, R. Geisler, 20 September 1967; 8 (19.5–50.5): Brazil, State of Pará, Curucumba River, 3 km north of Obidos airstrip (9 km north of Obidos), R. Geisler, 9 December 1967.

Diagnosis: The following combination of characters will distinguish this species from the other known species in the genus *Ammocryptocharax*. All teeth conical, 2 rows on dentary, never 3 rows near posterior termination of both dentary tooth rows. Pectoral-fin rays ii,5,i to ii,7,i, usually ii,6,i. Snout longer than horizontal diameter of eye. Usually 3 branchiostegal rays present. Supraneurals absent and mouth totally inferior.

In the description below, when counts vary, the first number given is for holotype unless otherwise designated. Figures in parentheses are for paratypes only (from Caño Muco) unless otherwise designated. When a number is spelled out, it refers to the number of specimens bearing the given counts.

Description: See Table 1 for a summary of morphometrics and meristics. Body elongate, sides moderately compressed, greatest depth at anterior dorsal-fin origin. Predorsal body profile nearly straight to head, gently convex to acute snout. Body profile along base of dorsal fin slightly convex. Body profile posterior to termination of base of dorsal fin nearly straight. Posterior to adipose fin body profile slightly concave. Ventral body profile very gently convex from tip of lower jaw to posterior termination of anal-fin base. Remaining ventral body profile slightly concave to ventral base of caudal fin. Head elongate, snout acutely conic, tip of snout overhangs anterior edge of lower jaw, mouth totally ventral. Posterior extreme of maxillary extends to a point ventral to anterior border of posterior nostril, not reaching eye. With mouth closed, maxillary bone nearly parallel with profile

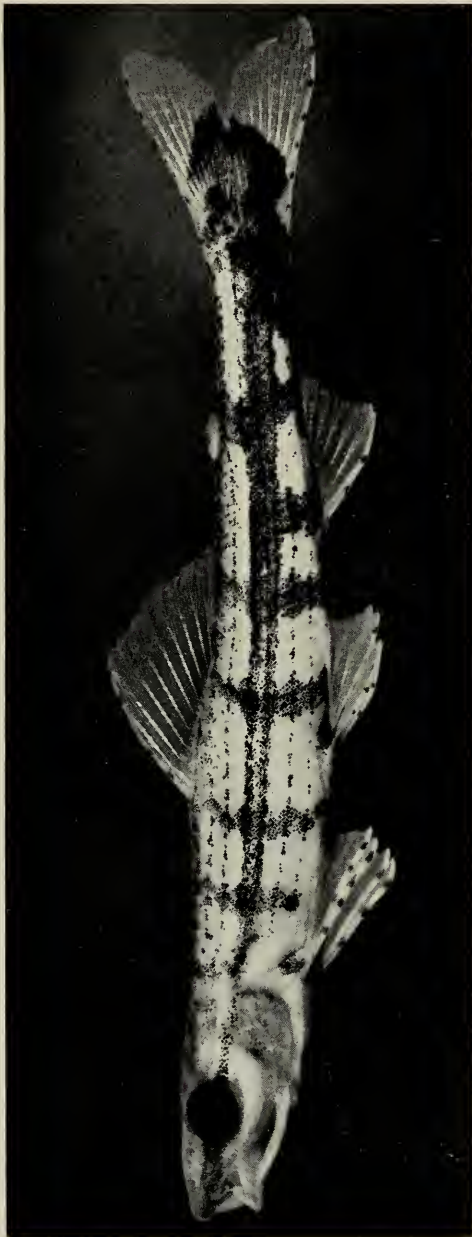


FIG. 2. *Ammocryptocharax elegans*, new species, USNM 210691, 32.3 mm SL Brazil-Bolivian border region between Guajaro-Mirim and Mato Grosso, Guaporé River drainage, 1970.

of head just ventral to maxillary. Eyes small in proportion to standard length (see Table 1).

Teeth simple, conic (all counts of teeth and gill arch structures from alizarin preparations; two specimens [paratypes] from Caño Muco given first, followed in brackets by five specimens [not paratypes] from Guaporé River). Rows of teeth on dentary 2, anterior (outer) row with 14 and 17 [12-15, usually 13] teeth, inner row with 18 and 21 [15-19, usually 17] teeth; premaxillary with 1 row of 11 [9-10, usually 10] teeth; maxillary with 1 row of 5 [4-7, usually 5] teeth; ectopterygoid with 1 row of 16 and 19 [4-22, highly variable, usually between 11 and 22 in specimens 35.4-38.7 mm SL, fewer, 4-6, in slightly smaller specimen, 34.2 mm SL]. Branchiostegal rays 3, ceratohyal with 2 of these rays, and 1 between ceratohyal and epihyal (for significance of variability of this count see discussion above); gill rakers short except for raker at angle of arch, 3 [2-3, usually 3 in Guaporé River specimens] on upper limb; 8 gill rakers, 2 without bony supports [6-7, usually 6 in Guaporé River specimens], on lower limb of first arch. Frontal-parietal fontanel absent between frontal bones; small and confined to junction with supraoccipital between parietal bones. First (anterior) circumorbital bone well ossified, antorbital and supraorbital well ossified and with laterosensory tubes in larger specimens, poorly ossified except for tubes in smaller specimens examined.

Scales cycloid with 5-10 radii on exposed field; lateral line complete, with a single unbranched tube on each scale; 41 (39-41) lateral-line scales; 4 scale rows above lateral line to dorsal-fin origin; 3 scale rows below lateral line to pelvic-fin origin in all specimens; 12 scale rows around caudal peduncle in all specimens; 11 (10-12, usually 11) predorsal scales; area on belly anterior to pectoral-fin base completely covered with scales in all specimens.

Dorsal-fin rays ii,9 (ii,9 but ii,10 in one specimen); dorsal-fin origin anterior to pelvic-fin origin and closer to tip of snout than to caudal-fin base; third dorsal-fin ray longest; distal fin margin slightly convex. Adipose fin present.

Anal-fin rays ii,7 (ii,7 but iii,5,i in one specimen); second ray longest; distal fin margin slightly concave.

Pectoral fin inserted low on body but not flattened at base to provide a flat surface to substrate as in some species of *Characidium*; pectoral-fin rays ii,6,i (ii,6,i in one, ii,7 in one, ii,8 in nine, and ii,8,i in one specimen). Posterior tip of longest ray not reaching pelvic fin.

Pelvic-fin rays ii,5,ii (ii,5,i in seven, ii,5,ii in two, ii,6,i in four specimens); pelvic fin large, but when adpressed to body, distalmost ray tip not reaching anus.

Caudal fin forked, with 17 branched rays in all specimens, principal ray count 10/9.

TABLE 1. Morphometrics of *Ammocryptocharax elegans* from the Río Orinoco basin.

	Río Muco, Colombia specimens		Caño Emma, Colombia specimens		Puerto Nuevo, Venezuela specimens		Puerto Ayacucho, Venezuela specimens		Río Yucao, Colombia specimens	
	Holo- type	Range (n = 14)	Range (n = 2)	Range (n = 3)	Range (n = 8)	Range (n = 10)	Range (n = 8)	Range (n = 10)	Range (n = 10)	Range (n = 10)
Standard length	38.5	32.0-40.5	36.8	37.0-38.5	37.5	27.5-32.5	29.7	35.0-51.5	41.1	30.5-42.5
Greatest depth	12.7	11.8-13.9	12.9	14.8-14.9	14.8	12.9-13.8	13.5	12.9-15.2	14.0	12.5-15.5
Snout to dorsal-fin origin	39.7	39.3-43.2	41.0	41.6-41.8	41.7	42.2-43.3	42.7	39.6-42.9	41.1	40.5-44.3
Snout to pelvic-fin origin	45.5	43.2-47.1	45.7	45.7-48.1	46.9	46.2-46.9	46.6	43.9-47.9	45.9	43.6-48.5
Snout to anal-fin origin	70.1	67.5-71.2	69.8	71.4-72.4	71.9	67.6-70.8	69.3	66.6-70.8	68.8	65.5-71.8
Caudal peduncle depth	7.3	6.8-7.9	7.4	7.5-7.6	7.6	6.9-7.6	7.2	7.3-8.2	7.8	6.5-7.8
Caudal peduncle length	22.1	21.8-23.6	22.7	20.8-21.8	21.3	22.2-23.1	22.5	20.6-23.2	21.6	20.5-23.2
Pectoral-fin length	14.8	14.6-17.8	16.3	14.3-16.5	15.6	16.0-18.3	17.2	12.6-16.9	15.3	14.0-17.1
Pelvic-fin length	13.5	13.0-16.4	14.7	14.0-15.1	14.6	14.5-14.8	14.6	12.8-15.2	14.2	13.8-16.1
Head length	23.1	23.1-25.6	23.9	23.4-24.3	23.9	24.9-26.9	25.9	23.0-25.9	24.6	23.9-25.8
Eye diameter	5.9	5.0-6.1	5.3	5.2-5.4	5.3	5.5-6.2	6.0	4.4-5.7	5.2	4.9-5.9

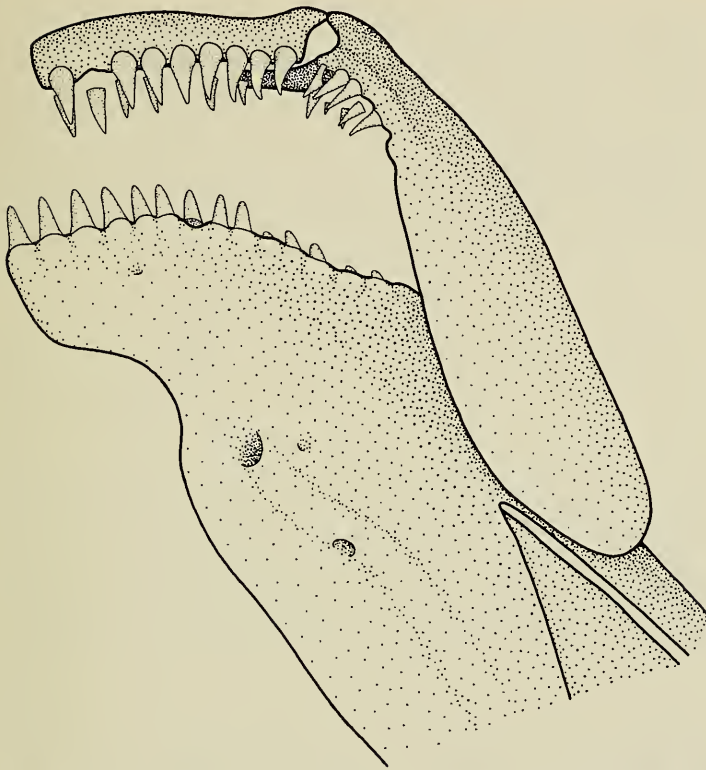


FIG. 3. *Ammocryptocharax elegans*, new species, USNM 214364, 38.5 mm SL, paratype, Colombia, State of Meta, Vichada River basin, Caño Muco about 15 km west of Puerto Gaitán toward Puerto Carreno, April 2, 1974. Ventral and slightly lateral view of premaxillary and maxillary (placed anteriorly towards top) and dentary bones. This illustration shows anterior placement of premaxillary bone in relation to dentary. Note replacement teeth in premaxillary dorsal (behind) outer row teeth. Second outer row tooth from left (medial end of premaxillary) has been shed and is being replaced by inner replacement tooth.

Total vertebrae including Weberian apparatus and posterior terminal half-centrum 38 (37, one; 38, nine; 39, two). First and second hypurals not fused, supraneurals absent. One postcleithrum on each side; cleithra anteriorly articulate with each other in a specialized non-movable joint; anterior three-fourths of coracoid bone closely applied to same bone on contralateral side.

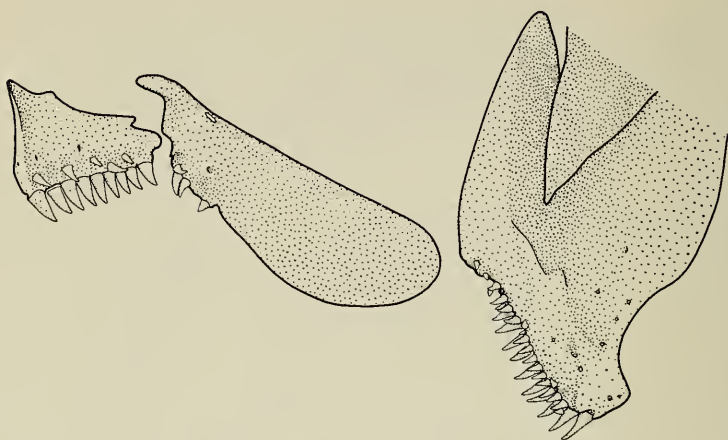


FIG. 4. *Ammocryptocharax elegans*, new species, USNM 210691, 34.8 mm SL, Brazil-Bolivian border region between Guajaro-Mirim and Mato Grosso, Guaporé River drainage, 1970. Internal view of premaxillary, maxillary, and dentary bones of right side, showing jaws in an extended position. Note there are only five replacement teeth present on premaxillary and one on maxillary. Only two small replacement teeth for the inner row of the dentary show in this jaw.

Color in alcohol: Body color pale yellowish brown, with a dark lateral stripe from tip of snout, across opercular region, along middle of body where it broadens and continues to caudal-fin base and the caudal fin. Stripe appears more faded in specimens from Guaporé River. Anterior end of stripe expanded over snout and onto maxillary and premaxillary areas, stripe darkest on maxillary, premaxillary, and area of nasal organs. Stripe becomes widest towards caudal-fin base, where it expands to form a dark blotch on caudal fin, reaching to posterior end of middle caudal-fin rays. Usually center of large dark blotch on proximal part of caudal fin pale or hyaline, especially in Guaporé River specimens. Below and dorsal to broad dark mid-lateral stripe occur 3 narrow horizontal, often interrupted, dark stripes; dorsalmost of these stripes extends from posterior end of head to an area ventral to mid-basal length of dorsal fin, or to posterior end of dorsal-fin base. Second of these dark stripes continues from posterior head termination beyond dorsal fin to intersect an imaginary vertical line above anterior anal-fin origin or extends to an area just posterior to adipose fin. Most ventral of 3 narrow dark stripes continues from posterior to eye to caudal-fin base. A narrow dorsal median stripe extends along back from nape to anterior dorsal-fin origin. This dorsal median stripe continues between dorsal-fin and adipose-fin bases and be-

tween adipose-fin and caudal-fin bases. Two and sometimes 3 narrow, often interrupted, horizontal dark stripes on sides below broad dark mid-lateral stripe; dorsalmost of these extends from just posterior to posterior termination of opercle to a vertical just dorsal to mid-length of anal-fin base or a vertical just posterior to posterior termination of anal-fin base. Middle of these 3 dark stripes interrupted, but extends from near posterior opercular termination to beyond anal fin where it continues as a series of spots to caudal-fin base. In Caño Muco specimens a third narrow dark stripe extends posteriorly from pectoral-fin base to pelvic-fin base. This third ventral dark stripe missing in specimens from Guaporé River.

About 8 more or less dark vertical bars on body; first begins at nape and ends ventrally at large dark mid-lateral stripe; large spot at pectoral-fin base may in life be continuous with ventral termination of first bar; next 2 dark bars occur between posterior border of gill cover and dorsal-fin origin, these extend a variable distance ventral to large lateral stripe; fourth and fifth vertical dark bars of variable occurrence, placed ventral to dorsal fin and may extend ventrally and then to meet similar bars on contralateral side [*i.e.*, completely around body (specimens from Guaporé River)]; sixth vertical dark bar begins at anal-fin origin and extends dorsally, ending at large mid-lateral stripe in Guaporé River specimens, extending onto back in specimens from Caño Muco; seventh vertical dark bar occurs between adipose fin and posterior end of anal-fin rays or anal-fin base; eighth dark bar broad, occurring just ventral to lateral stripe and anterior to caudal-fin base, being continuous with ventral part of caudal-fin blotch and itself more in nature of a blotch.

Vertical fins mostly hyaline except for dark color on caudal fin described above; 2 or 3 dark spots on anterior first and second rays of dorsal and anal fin, sometimes 4 on dorsal fin; distal half of caudal-fin lobes hyaline; dorsalmost and ventralmost principal caudal-fin rays with about 4 to 6 dark spots more or less evenly spaced along course of rays; adipose fin with a dark spot or stripe along dorsal border, sometimes with a dark spot on center part of fin.

Axillary base of pectoral fin with a dark blotch; anterior rays of this fin with 2 to 4 (usually 3) dark spots, remainder of pectoral fin hyaline. Pelvic fins with 2 dark spots on anterior fin ray and 1 dark spot on distal portion of second fin ray.

Iris of eye black; cheek, lower jaw, area of branchiostegal rays, and belly, pale brown or white.

Color in life: We recently received ten specimens of *A. elegans* from a tributary of the Yucao River, approximately 4.7 km west of Puerto Gaitán, Meta River system, Colombia, collected in January of 1973 and sent to us by Donald Taphorn, Department of Natural Sciences, University of Florida. At the time of capture some of these specimens were photographed in color. These photographs show a fish with the general dark pigment as described above, with the back

TABLE 2. Morphometrics of specimens from the Rio Amazonas basin.

	Rio Guaporé		Puerto Velho		Igarapé de Perera		Guajara-Mirim		Obidos	
	Range (n = 25)	\bar{x}	Range (n = 2)	\bar{x}	Range (n = 9)	\bar{x}	Range (n = 5)	\bar{x}	Range (n = 8)	\bar{x}
Standard length	28.5-39.8	34.3	45.0-51.0	48.0	23.5-42.5	27.7	24.0-30.0	26.8	19.5-50.5	38.1
Greatest depth	13.0-16.1	14.7	12.9-14.9	13.9	14.1-17.3	15.3	14.2-15.0	14.5	13.9-15.9	14.9
Snout to dorsal-fin origin	38.6-43.5	41.6	38.2-40.4	39.3	39.52-42.55	41.53	43.0-45.4	44.3	38.8-46.7	41.9
Snout to pelvic-fin origin	47.1-50.0	48.3	45.3-48.0	46.6	46.0-49.2	47.8	48.7-51.3	49.4	44.5-50.8	46.3
Snout to anal-fin origin	69.7-74.4	72.0	70.6-72.4	71.5	67.9-71.4	69.1	70.3-72.7	71.6	65.9-75.4	69.5
Caudal peduncle depth	7.0-8.7	7.8	7.3-7.8	7.5	7.1-8.5	8.0	7.3-8.3	7.7	7.2-8.4	8.0
Caudal peduncle length	19.1-22.1	20.7	21.6-21.6	21.6	20.7-23.5	21.9	20.0-21.0	20.6	17.9-25.2	22.3
Pectoral-fin length	15.7-18.6	17.2	13.9-15.3	14.6	14.1-21.3	19.2	18.0-20.4	19.6	12.5-27.2	17.4
Pelvic-fin length	14.9-16.8	15.5	13.5-14.6	14.05	13.6-17.0	15.6	16.0-17.1	16.5	13.5-19.0	16.0
Head length	23.4-26.4	25.3	21.8-23.1	22.5	23.8-27.5	25.8	26.3-28.8	27.7	22.6-28.2	24.8
Eye diameter	4.8-6.1	5.5	4.1-4.7	4.4	4.7-9.3	6.4	6.3-7.3	6.7	4.1-8.2	5.5



FIG. 5. *Ammocryptocharax vintoni* (Eigenmann), SU 21779, 55.0 mm SL, Guyana, Shrimp Creek, below Kaieteur Falls, Potaro River, Essequibo River basin, October 30, 1908.

above the elongate dark stripe a translucent brown color and the stripe itself as well as the sides below a green or bluish green. Jamie Thomerson and Graciella Cannella (pers. comm.) have seen the green bright "grassy" color in live specimens. In the photographs available, the green color appears to make the elongate dark stripe very dark green while the area ventral to it is a rather pale green or bluish green.

Variation: We have small samples from a wide range of localities in at least three countries, from the Orinoco drainage in Venezuela to the Guaporé River along the Brazilian and Bolivian border region and along the main course of the Amazon River into the State of Pará. Tables 1 and 2 show a few differences in morphometric character states in specimens from some of the different localities; however, the geographical distribution of our samples is very incomplete and, therefore, useful comparison of samples from adjacent drainage basins cannot be made. Some geographic variation in color pattern has been noted in the color description above.

Relationships: *A. elegans* is most closely related to *A. vintoni*. Both species are long, with slender, cylindrical body and a ventral mouth [compare Figs. 1 and 2 with Fig. 5 and with plate 38, figs. 1 and 2 in Eigenmann (1912)]. No other known species in the Characidiinae approaches these 2 in body shape and head shape. Both species have a similar color pattern with a well-developed mid-longitudinal stripe. The above characteristics are probably specialized for the Characidiinae and therefore are useful in relating these 2 species. The ventral mouth and elongate body may be adaptations shared by these 2 species for swift shallow water such as rocky riffles.

There is little information concerning the habitats of *A. elegans* and especially *A. vintoni*. *A. vintoni* was taken by Eigenmann from Shrimp Creek, a precipitous forest stream below Kaieteur Falls, Guyana, Eigenmann (1912:53, fig. 21). *A. elegans* was taken from "plant infested riffles" of the Caño Muco by Thomerson and party. Böhlke and party

TABLE 3. Morphometrics of *Ammocryptocharax vintoni*.

	Shrimp Creek, Guyana		Amatuk, Guyana (n = 1)
	Range (n = 13)	\bar{x}	
Standard length	42.5-65.5	54.4	26.0
Greatest depth	16.6-19.5	18.0	17.3
Snout to dorsal-fin origin	43.5-47.2	45.4	46.2
Snout to pelvic-fin origin	50.0-54.2	52.3	50.7
Snout to anal-fin origin	75.4-78.5	76.3	74.0
Caudal peduncle depth	9.7-10.7	10.1	—
Caudal peduncle length	17.0-21.2	18.8	19.2
Pectoral-fin length	25.8-29.6	28.1	26.9
Pelvic-fin length	18.9-21.3	20.5	—
Head length	25.0-27.6	25.9	29.6
Eye diameter	5.4-6.5	5.9	7.3

took the fish in the Caño Emma, a stream with "strong to moderate" current, and water that was "clear to tea colored." It had a pebble and sand to mud substrate with algae and occasionally grass-like plants in water of a depth of up to about $\frac{1}{2}$ m. There is no information available on the habitat of *A. elegans* from the Guaporé River or other localities listed above except for the igarapé Tarumazinho 45 km north of Manaus, Amazonas, where Graciella Cannella reported that the 1 specimen was taken in aquatic vegetation.

Apparently the habitats of these 2 species have not been much sampled in the past. *A. vintoni* has been taken only twice and from adjacent localities, while *A. elegans*, although widely distributed, has been collected only within the last few years. Neither of these fishes has been extensively observed in its natural habitat. Probably *A. elegans* is common in appropriate habitat all along the tropical eastern base of the Andes mountain range and along the Amazon river itself.

Although apparently closely related, *A. elegans* and *A. vintoni* differ in several easily discernable characters. Both species have basically similar color patterns but with some minor differences. The 2 dark narrow stripes dorsal to the large midside dark stripe appear narrow in *A. elegans* and broad in *A. vintoni*, at least in preserved specimens. *A. elegans* has 2 narrow longitudinal dark stripes on each side, ventral to the broad longitudinal stripe; these appear absent in *A. vintoni*. *A. elegans* has the leading rays of the fins with small but prominent black spots; these are completely lacking in *A. vintoni*.

Even more striking than the color pattern differences in these species is the difference in pectoral-fin morphology. Many species of *Characidium* have the anterior 2 or 3 pectoral-fin rays thickened. This

is associated with the fact that many of the fishes in the Characidiinae spend part of their time sitting on the substrate supported by these fins (as well as the thickened ventral fin rays of the pelvic, anal, and caudal fins). *A. elegans* has the anterior 2 rays of the pectoral fin thickened, unbranched, and of about equal length. *A. vintoni* has the anterior 4 fin rays somewhat thickened and unbranched but they are not all of equal length. The anterior ray is shortest, about half the length of the fourth, while the second and third rays are of intermediate length, the third being longer than the second. Most species of the Characidiinae have three unbranched anterior pectoral-fin rays of graded length (the shorter rays occurring anteriorly). A few have four unbranched rays (for example *A. vintoni* and *Jobertina eleotrioides* Géry). Only *A. elegans* has 2 thickened rays and these are of about equal length; in this respect *A. elegans* appears specialized, differing from all known species of the Characidiinae. *A. elegans* has a total of 8 to 10, usually 9 pectoral-fin rays while *A. vintoni* has 12-13, usually 13. The relative length of the pectoral (and pelvic) fins is different in the 2 species, the fins being longer in *A. vintoni* than in *A. elegans* (compare in Tables 1-3).

There are other differences in the two species. All specimens of *A. elegans* have 12 scale rows around the caudal peduncle while 16 specimens of *A. vintoni* have 14. In adults, *A. vintoni* usually has about 19 to 20 tricuspid to conic teeth in the posterior (inner) dentary row, whereas *A. elegans* has 12 to 17 (usually 15) conic teeth in the anterior (outer) row and 15 to 21 (usually 17) conic teeth in the posterior (inner) row. There are 4 to 7 conic maxillary teeth in *A. elegans* and 8 to 10 tricuspid maxillary teeth in *A. vintoni*. *A. elegans* has 9 to 11 conic premaxillary teeth and *A. vintoni* has 13 to 15 tricuspid premaxillary teeth. The ectopterygoid of *A. vintoni* has 24 conic teeth in each of 2 rows along its length and a third greatly interrupted row of 8 to 10 conic teeth. In *A. elegans* the conic ectopterygoid teeth are highly variable with 4 to 22 in a single row. The mesopterygoid of *A. vintoni* anteriorly bears a patch of about 30 small conic teeth. These teeth are completely absent in *A. elegans*. Comparison of proportional measurements in percentages of standard length also shows important differences in the 2 species (see Tables 1-3, note especially the differences in the greatest body depth and caudal peduncle depth).

A. elegans often appears to have one more vertebra than *A. vintoni*. Twenty-one specimens of *A. elegans* had counts as follows: 37 (seven); 38 (eleven); 39 (four). *A. vintoni* had: 37 (thirteen) and 38 (one). The Weberian apparatus and the terminal half-centrum are included in these counts.

A. vintoni appears more primitive than *A. elegans* in having a larger number of teeth on all tooth-bearing bones as well as retaining mesopterygoid teeth. Furthermore, the mouth of *A. vintoni* is not as ventral as that of *A. elegans* and its body is not as elongate and slender.

Supraneurals are absent in *A. elegans*, while a few are present in *A. vintoni*, a more primitive situation. On the other hand, *A. vintoni* does have more elongate pectoral and pelvic fins, presumably a more advanced feature.

Etymology of species name: From the Latin word *elegans*, meaning special, choice, fine, select.

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R E S U M E N

En varias colecciones de peces efectuadas en localidades de poca altitud relativa en la Cordillera de Los Andes, desde Bolivia hasta Colombia y Venezuela, y a lo largo del río Amazonas hasta Obidos, Pará, Brasil, se encontró una nueva especie de pez Characoidei, Characidiinae, que se designa aquí con el nombre de *Ammocryptocharax elegans*. Esta nueva especie tiene el cuerpo alargado, boca ventral y hocico cónico, presentando una apariencia similar a los "sand darters" de la América del Norte del género *Ammocrypta* Jordan. La nueva especie, que se sabe vive entre la vegetación de pequeños cursos de corriente rápida, está estrechamente relacionada con *Characidium vintoni* Eigenmann (1909) que se conoce sólo de los saltos en ríos pequeños por debajo de Kaiteur Falls, Guyana.

La nueva especie y *C. vintoni* se colocan en un nuevo género, *Ammocryptocharax*, el cual podría estar vinculado con *Klausewitzia* Géry (1965b). Este nuevo género se separa de los restantes conocidos entre los Characidiinae por la posesión de los caracteres siguientes: hueso maxilar con una fila única de dientes cónicos o tricúspides, que no exceden 10 en número, a lo largo de su borde anterior ventral;

dientes ectopterigoideos presentes; boca ventral; menos de 17 radios dorsales.

A. elegans y *A. vintoni* pueden distinguirse porque la primera especie presenta todos los dientes cónicos, mientras que la segunda tiene dientes tricúspides en los huesos premaxilar, maxilar y dentario. *A. vintoni* tiene dientes cónicos pequeños en el mesopterigoideo los cuales están ausentes en *A. elegans*. Los primeros dos radios pectorales anteriores de *A. elegans* son gruesos, no ramificados y más o menos del mismo largo. *A. vintoni* tiene los cuatro primeros radios pectorales anteriores algo engrosados y no ramificados, pero no son del mismo largo. El radio más anterior es el más corto, alrededor de la mitad del largo del cuarto, mientras que los otros dos radios restantes tienen una longitud intermedia.

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